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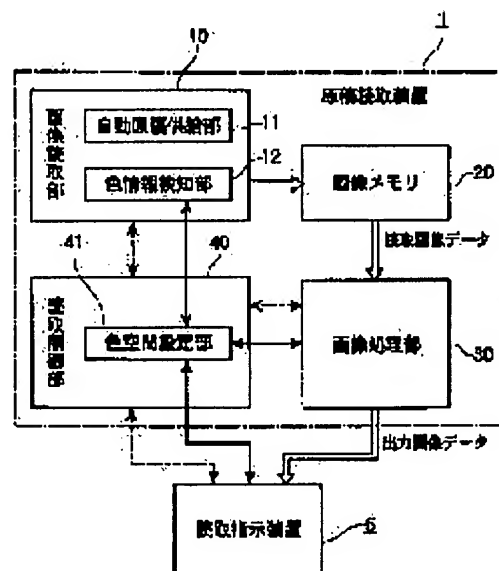
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## (54) ORIGINAL READER AND ORIGINAL READ SYSTEM USING IT

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide an original reader that can individually designate a color space of output image data with respect to each original and to provide an original read system using it.

SOLUTION: In the case that original reading in an automatic color selection mode is designated for the original reader 1 having an automatic draft feeding section 11, a color space setting section 41 provided for a read control section 40 reads an original by selecting an existing color space for an output color space on the basis of color information detected by a color information detection section 12 as a basic operation. Furthermore, when a read instruction device 5 instructs a designated color space individually to an optional original, the designated color space is used for color.



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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is equipped with an automatic manuscript supply means, and relates to manuscript readers, such as a scanner which can read the image data of two or more manuscripts continuously, and the manuscript reading system using it.

[0002]

[Description of the Prior Art] Conventionally, manuscript readers, such as a copying machine which has a scanner equipped with an automatic manuscript feeder (ADF:Automatic Document Feeder) and scanner ability, are known. In such a manuscript reader, a set of the manuscript bundle which becomes an automatic manuscript feeder from two or more manuscripts performs one reading of sequential conveyance and manuscript [ as opposed to / it is supplied and / each manuscript ] image data at a time for a manuscript continuously by the automatic manuscript feeder (for example, JP,10-200682,A).

[0003]

[Problem(s) to be Solved by the Invention] The reading image data of the manuscript read by the image read station of a manuscript reader is outputted as output image data, after being changed according to a predetermined image data format which usually includes the specified color space (about a color space conversion, it is JP,8-88780,A, for example).

[0004] Manuscript reading may be performed by the automatic colour selection mode in which the color space applied to the output image data of each manuscript is set up automatically when performing continuous manuscript reading about this color space using an automatic manuscript feeder. With the color information detection means formed in the image read station, color information is acquired about each manuscript and, specifically, a color copy or monochrome manuscript is detected. And based on the detection result, the fixed color space beforehand given to each of a color copy and monochrome manuscript is automatically chosen as an output color space applied to the data format of the output image data of the manuscript, and is set up.

[0005] However, in manuscript reading using an automatic color optional feature which was described above, since reading by automatic colour selection mode is continuously performed to all the manuscripts contained in the set manuscript bundle, there is a problem that an output color space cannot be changed to some manuscripts in a manuscript bundle. For example, it is necessary to the manuscript to create the image data based on the color space set to thumbnail images to create a thumbnail about a certain specific manuscript in a manuscript bundle.

[0006] When automatic colour selection mode is chosen at this time, the problem on working efficiency -- by the automatic color optional feature, the output image data outputted in the output color space chosen and set up from the fixed color space must be anew changed into the color space for thumbnails, and image data must be generated -- is produced. Moreover, it cannot respond to various demands in each manuscript reading activity to set up the same color space as a color copy to specific monochrome

manuscript.

[0007] This invention is made in view of the above trouble, and when automatic colour selection mode is specified, it aims at offering the manuscript reader which can specify the color space of the output image data to each manuscript according to an individual, and the manuscript reading system using it.

[0008]

[Means for Solving the Problem] In order to attain such a purpose, the manuscript reader by this invention An automatic manuscript supply means which is a manuscript reader and carries out sequential supply of the manuscript from (1) manuscript bundle by which the image data of each manuscript can be continuously read about the manuscript bundle which consists of two or more manuscripts, The image read station which has a color information detection means to detect the color information on a manuscript, reads the supplied manuscript, and generates reading image data, (2) The image-processing section which generates the output image data by which transform processing was carried out to the output color space where reading image data was read and the color space was set up to the manuscript, (3) It has the reading control section which controls an image read station and the image-processing section. (4) reading control section It is characterized by having a color space setting means to set up the output color space to each manuscript based on the appointed color space specified to the color information on the manuscript from a color information detection means, or a manuscript.

[0009] In manuscript reading actuation in the conventional automatic colour selection mode in the manuscript reader equipped with the automatic manuscript feeder, a corresponding fixed color space is chosen as an output color space based on the color information on the color copy detected to each manuscript, or monochrome manuscript. On the other hand, in the color space setting means of a reading control section formed in the above-mentioned manuscript reader, it considers as the configuration which can set up the output color space applied to the manuscript based on them with reference to the appointed color space specified according to the individual to each manuscript in addition to the detected color information.

[0010] It becomes possible to change an output color space and to generate output image data by the appointed color space to the manuscript of the arbitration which needs to generate the image data using other color spaces as a data format, performing manuscript reading actuation by the automatic color optional feature as the basic actuation, when automatic colour selection mode is specified as a mode of operation by this.

[0011] Moreover, if a color space setting means has the assignment of the appointed color space to a manuscript, and there is no assignment about the appointed color space again, it will be characterized by setting up the fixed color space corresponding to the color information from a color information detection means as an output color space to each manuscript.

[0012] Thus, coexistence with the basic actuation by automatic colour selection mode, and the color space assignment and modification to manuscript reading of a part is efficiently realizable by setting up the appointed color space specified according to the individual, or the fixed color space based on the detected color information as an output color space by the existence of assignment of a color space to each manuscript.

[0013] In this case, since the fixed color space in automatic colour selection mode is not changed when the appointed color space is applied to a certain manuscript reading, when

not performing color space assignment to continuing reading, it can be made to return to manuscript reading actuation in the usual automatic colour selection mode again.

[0014] Moreover, a reading control section is characterized by setting up or changing the count of activation of the image reading and the image processing by the image read station and the image-processing section to the same manuscript to each manuscript.

[0015] While this can perform manuscript reading of multiple times to the same manuscript, it becomes possible to consider as the count of manuscript reading which changes with each manuscripts. For example, when manuscript reading is being performed so that each manuscript may be read by a unit of 1 time in principle, the count which performs manuscript reading if needed to the manuscript of arbitration can be changed, and it can read two or more times.

[0016] Furthermore, a reading control section is good also considering setting up an output color space for every time in a color space setting means as a description, when the count of activation of the image reading and the image processing by the image read station and the image-processing section to the same manuscript is multiple times. In this case, two or more image data from which a color space differs is acquirable to the same manuscript, such as acquiring a thumbnail image and this image. In addition, multiple times can also be read by the same color space.

[0017] Moreover, the manuscript reading system by this invention has the manuscript reader which carried out (1) above, and the reading designating device which is connected to (2) manuscript reader and directs the appointed color space to a color space setting means.

[0018] The color space setting means formed in the manuscript reader mentioned above functions to an external instrument as an interface which can direct or control the appointed color space according to an individual to each manuscript. Therefore, it can consider as a configuration with the operator of manuscript reading for example, able to direct the appointed color space from the designating device which is an external instrument by connecting a reading designating device further and constituting a manuscript reading system to this manuscript reader.

[0019] Moreover, this reading designating device is good also considering performing further supply of the manuscript by the automatic manuscript supply means, or directions of exchange as a description. When reading multiple times to the same manuscript by this, it can direct whether for manuscript exchange to be carried out and to shift to reading of degree manuscript, or read again, without carrying out manuscript exchange.

[0020] Furthermore, a reading control section is characterized by outputting the color information from a color information detection means to a reading designating device. The efficiency of the directions about manuscript reading actuation -- the color information detected to the manuscript in selection of the appointed color space by the operator etc. by this can be referred to -- can be increased further.

[0021]

[Embodiment of the Invention] Hereafter, the suitable operation gestalt of the manuscript reader by this invention and a manuscript reading system is explained to a detail with a drawing. In addition, in explanation of a drawing, the same sign is given to the same element, and the overlapping explanation is omitted.

[0022] Drawing 1 is the block diagram showing the configuration of 1 operation gestalt of a manuscript reading system equipped with the manuscript reader by this invention.

This manuscript reading system is equipped with the manuscript reader 1 and the reading designating device 5. Here, in the continuous-line arrow head, about each arrow head in drawing 1, the double-line arrow head shows the data path to which a control path [ arrow head / dotted-line / path / about the color information of the control paths and a color space / control / except color information and a color space ] is sent in the image data of a manuscript, respectively.

[0023] The manuscript reader 1 has the image read station 10, an image memory 20, the image-processing section 30, and the reading control section 40, and is constituted. The automatic manuscript feed zone 11 is installed in the image read station 10, and if the manuscript bundle which consists of two or more manuscripts is set to this automatic manuscript feed zone 11 and reading is started, the automatic manuscript feed zone 11 will do supply and conveyance of one manuscript which reads at a time.

[0024] About each manuscript supplied from the automatic manuscript feed zone 11, the temporary storage of the reading image data of the manuscript read by the image read station 10 is carried out to an image memory 20. Furthermore, this reading image data is read by the image-processing section 30, transform processing is carried out to the image data which has a predetermined image data format, and output image data is generated.

[0025] Manuscript reading actuation of the manuscript reader 1 containing the image read station 10 and the image-processing section 30 is controlled by the reading control section 40. It connects by the serial line to the image read station 10, the image-processing section 30, and the reading designating device 5 mentioned later, and this reading control section 40 is performing control, directions, etc. of each part.

[0026] The reading control section 40 performs manuscript reading directions, directions of manuscript supply and exchange, etc. to the image read station 10. Moreover, directions of transform processing of image data, assignment of the image data format to change, etc. are performed to the image-processing section 30. According to the motion control of each part of equipment by this reading control section 40, sequential execution of image reading to each of the manuscript contained in a manuscript bundle, an image processing, the output to the exterior, etc. is carried out.

[0027] There is a color space of image data as one of the elements which specifies the image data format of output image data mentioned above. The output color space applied to output image data is set up to each manuscript in the color space setting section 41 prepared in the reading control section 40. The output color space set up in the color space setting section 41 is directed to the image-processing section 30, and the image-processing section 30 performs transform processing from reading image data to output image data according to a predetermined image data format including the directed output color space.

[0028] Furthermore, the manuscript reader 1 shown in drawing 1 has the automatic colour selection mode in which an output color space is set up automatically, as one of the modes of operation, and is constituted. The color information detection section 12 used in automatic colour selection mode is formed in the image read station 10 shown in drawing 1. This color information detection section 12 detects which [ of a color copy or monochrome manuscript ] is each manuscript, and notifies the color information (a color or black and white) which it is as a result of detection to the reading control section 40. In automatic colour selection mode, the color space setting section 41 of the reading control section 40 chooses the fixed color space corresponding to the detected color information

from the fixed color space prepared beforehand based on the color information over each manuscript from the color information detection section 12, sets it up as an output color space of the manuscript, and is directed to the image-processing section 30.

[0029] In such automatic colour selection mode, in addition to selection from the above-mentioned fixed color space, in this operation gestalt, the color space setting section 41 is constituted so that it may be possible to specify an output color space according to an individual to each manuscript.

[0030] Namely, although the color space setting section 41 chooses and sets up an output color space from a fixed color space based on the color information from the color information detection section 12, when the appointed color space is directed according to the individual to the manuscript, irrespective of the acquired color information and a corresponding fixed color space, it sets up the appointed color space as an output color space, and directs it to the image-processing section 30. Therefore, also in automatic colour selection mode, it is supposed that it is possible to specify a different color space from the fixed color space automatically chosen to the manuscript of the arbitration in a manuscript bundle as an output color space.

[0031] Moreover, the reading control section 40 is constituted so that it may be possible to carry out motion control of the image read station 10 and the image-processing section 30 so that image reading and the image processing of multiple times may be performed to the same manuscript. For example, even when manuscript reading is being performed by a unit of 1 time to each manuscript, it is possible to change the count of manuscript reading if needed to the manuscript of arbitration, and to read two or more times.

Furthermore, it is supposed that it is possible to set up an output color space for every reading in the color space setting section 41 to the same manuscript. Two or more output image data of the same manuscript by different color space is acquirable, such as performing reading by the fixed color space after reading by the appointed color space by this. Moreover, it is also possible to perform multiple-times reading in the same color space.

[0032] In this operation gestalt, the reading designating device 5 is connected to the above-mentioned manuscript reader 1, and the manuscript reading system is constituted. It becomes a configuration with an operator able [ as for the color space setting section 41 ] to direct the appointed color space to the color space setting section 41, such as inputting a color space and directing it to the manuscript reader 1, by functioning as the reading control section 40 and an interface with which directions of the appointed color space are especially enabled to an external instrument, and connecting the reading designating device 5 as an external instrument.

[0033] In addition, the reading designating device 5 is good besides an output color space to direct exchange and supply of the manuscript by the automatic manuscript feed zone 11 to the reading control section 40 further etc. also as a configuration which performs various directions about reading actuation. Furthermore, reception of the output image data from the image-processing section 30, an output, a display, etc. may be performed to coincidence.

[0034] It is the I/O device which has a required I/O function as such a reading designating device 5, and what is further connected to the host computer etc. can be used. Moreover, reading designating device 5 the very thing may be a host computer. Or it can also consider as the configuration in which it connected with the manuscript reader 1 and

the reading designating device 5 was installed in one. Moreover, storage, such as indicating equipments, such as a display, and a hard disk, may be formed if needed. In addition, about the directions about the color space from the reading designating device 5 to the manuscript reader 1, manuscript exchange, etc., it is desirable to carry out with the command set up beforehand.

[0035] Actuation of the manuscript reader by this invention and a manuscript reading system is explained. Drawing 2 is a flow chart which shows an example of actuation of the manuscript reading system shown in drawing 1.

[0036] First, if manuscript reading initiation with automatic colour selection mode is directed from the reading designating device 5 after the manuscript bundle which consists of two or more manuscripts which it is going to read is set to the automatic manuscript feed zone 11 (step S101), a manuscript will be supplied from the automatic manuscript feed zone 11 (step S102), and the color information on the supplied manuscript will be detected by the color information detection section 12 (step S103). Here, it is detected as color information which [ of a color copy or monochrome manuscript ] is the manuscript, and it is notified to the color space setting section 41.

[0037] Next, a setup of an output color space is performed in the color space setting section 41. First, it is judged whether assignment of the color space to apply is carried out (step S104). And if are specified, and it is set up with the output color space = appointed color space (step S105) and is not specified on the other hand, it is set up with an output color space = fixed color space (step S106). Here, a fixed color space is read, is beforehand given at the time before initiation of initiation, and in drawing 2, if it is a color information = color and they are fixed color space = YMCK and color information = black and white, it is set to fixed color space = K.

[0038] Image reading will be performed, if the output color space applied to output image data by the appointed color space or the fixed color space is set up and it is directed to the image-processing section 30 (step S107) (step S108). That is, the image of a manuscript is read in the image read station 10, reading image data is outputted to an image memory 20, and transform processing of the reading image data is carried out to output image data by the predetermined image data format which includes the directed output color space in the image-processing section 30 further.

[0039] Termination of image reading of a manuscript judges whether there are any directions of manuscript exchange (step S109). If there are no directions of manuscript exchange, in order to perform reading about the same manuscript again, actuation of steps S104-S109 is repeated. If there are directions of manuscript exchange, it will be judged whether the following manuscript is in the automatic manuscript feed zone 11 (step S110). If there is the following manuscript, actuation of steps S102-S110 will be repeated to the manuscript. If there is no following manuscript, manuscript reading about the manuscript bundle will be ended.

[0040] The effectiveness of the manuscript reader by this invention and a manuscript reading system is explained. In the manuscript reader 1 of the above-mentioned operation gestalt, and the manuscript reading system using it, it is possible to specify an output color space irrespective of the color information detected also in automatic colour selection mode in an example of the actuation as shown in drawing 2.

[0041] That is, in the usual automatic colour selection mode, the fixed color space which corresponds based on the result of color information detection (step S103) is chosen as an



output color space (step S106). On the other hand, in the above-mentioned manuscript reader 1, it judges whether assignment of a color space is carried out in the color space setting section 41 (step S104). And when there is no assignment of a color space, an output color space is set up from a fixed color space like actuation in the usual automatic colour selection mode, but when there is assignment of a color space, the appointed color space is set up as an output color space (step S105).

[0042] This enables it to direct the color space as an appointed color space in automatic colour selection mode to also set working and acquire the image data in other color spaces to the manuscript of arbitration. For example, the output image data in a different color space at the time of manuscript reading can be acquired by directing the color space for thumbnails as an appointed color space to create a thumbnail image to a specific manuscript, without doing the data-conversion activity after image data acquisition.

[0043] Moreover, manuscripts are exchanged after judging whether directions of manuscript exchange are after manuscript reading termination (step S109). Therefore, two or more output image data, such as image data based on a different color space, can be acquired to the same manuscript, without directing manuscript exchange. In this case, it is possible to set up or change separately the count of activation of manuscript reading to each manuscript. For example, two reading actuation can be performed by the color space corresponding to each to the manuscript which wants to acquire a thumbnail image and this image. Moreover, multiple times can also be read by the same color space.

[0044] In addition, although it is also possible to change the fixed color space corresponding to color information itself with directions about modification of the output color space by the appointed color space, in the above-mentioned operation gestalt, the appointed color space is applied about a setup of a fixed color space, without changing. Therefore, when a color space is specified according to an individual to a certain manuscript reading, it is possible to return to reading actuation with the automatic colour selection mode usual by the next reading, without performing a color space setup for the second time.

[0045] Moreover, although the reading designating device 5 is used for the input of the appointed color space, it is good also as a configuration which output the color information acquired by the color information detection section 12 to the reading designating device 5 through the reading control section 40, it is made to display on a display, and an operator determines the appointed color space based on the information, and is inputted from the reading designating device 5.

[0046] Drawing 3 is drawing showing the directions and control between the reading designating device 5, the reading control section 40, the image read station 10, and the image-processing section 30, and each information and image data flow about other examples of actuation of the manuscript reading system shown in drawing 1.

[0047] First, if reading initiation directions with automatic colour selection mode are performed from a designating device 5 to a control section 40, a control section 40 directs reading processing initiation for reading actuation initiation and manuscript supply initiation to the processing section 30 again to a read station 10 (step S201). A read station 10 detects the color information about the manuscript supplied by the color information detection section 12. This color information is notified to a control section 40 and a designating device 5 (step S202).

[0048] 1st image reading is performed with reference to the notified color information

(step S203). After a color space is specified as RGB in this reading, directions of manuscript reading are performed. A control section 40 directs output image data generation which set the output color space to RGB for directions of reading to the processing section 30 again to the read station 10 based on these assignment and directions, and image reading, an image processing, and an output are performed by this. [0049] 2nd [ further ] image reading is performed in the example of operation shown in drawing 3 (step S204). Directions of manuscript reading are performed without performing assignment of a color space in this reading. Like the 1st reading, to a read station 10, a control section 40 directs output image data generation to the processing section 30 again, and image reading, an image processing, and an output are performed in directions of reading.

[0050] Output image data generation is directed by making into an output color space K which is the fixed color space which corresponds YMCK which is the fixed color space which corresponds based on the color information acquired in step S202 if it is a color copy since the appointed color space is not directed at this time again if it is monochrome manuscript. In addition, about these fixed color spaces, there is the setting approach of directing from a designating device 5 to a control section 40 in step S201 at the time of reading initiation directions.

[0051] Manuscript exchange is directed from a designating device 5 to a read station 10 through a control section 40 after the 2nd image reading termination (step S205). And detection and a notice of color information are performed like step S202 to the exchanged manuscript (step S206), and the next manuscript reading actuation is started with reference to the color information. Such reading actuation is repeated until reading of all manuscripts is completed.

[0052] After reading of all manuscripts is completed, directions of reading actuation termination are carried out from a designating device 5 to a read station 10 and the processing section 30 through a control section 40, and all reading actuation about this manuscript bundle is ended (step S207).

[0053] The manuscript reader and manuscript reading system by this invention are not restricted to the above-mentioned operation gestalt, and modification of various deformation or a configuration is possible for them. About a manuscript reader, it can consider as various equipments which have a manuscript reading function, such as a scanner for manuscript reading, and a copying machine which has scanner ability. Moreover, not only a thing but various manuscript reading motion control shown in drawing 2 and drawing 3 is possible also about the concrete actuation.

[0054]

[Effect of the Invention] The manuscript reader and manuscript reading system by this invention acquire the following effectiveness, as explained to the detail above. That is, when automatic colour selection mode is directed, it considers as the configuration whose color space setting section of a reading control section sets up an output color space also with reference to the appointed color space specified according to the individual to the manuscript apart from the fixed color space chosen based on the color information detected in the color information detection section of an image read station in the manuscript reader which is equipped with an automatic manuscript feeder and reads two or more manuscripts continuously. Considering automatic colour selection mode as basic actuation, when applying the color space where the degree of freedom of a setup of

manuscript reading actuation with automatic colour selection mode improves sharply, for example, differs from other manuscripts to the manuscript of the arbitration in a manuscript bundle by this, or when acquiring two or more image data in a different color space to the same manuscript, an output color space is changed suitably and it becomes possible to perform various reading actuation.

[0055] In this case, since the need for only a specific manuscript reading again after reading termination of a manuscript bundle, or changing the read image data etc. is lost, a manuscript reading activity is simplified. For example, since modification of such a color space may be needed in the image data control by image data filing etc., the efficiency can be increased also about simplification of a manuscript reading activity, and management of the image data read by coincidence by considering as the above manuscript readers and the manuscript reading structure of a system.